

**Amendments to the claims:**

**Cancel claims 15-35.**

1           13.     (Original)           A method of making a read head that has an air bearing surface  
2     (ABS) comprising the steps of:  
3           forming a ferromagnetic first shield layer;  
4           forming an antiferromagnetic pinning layer on the first shield layer;  
5           forming a ferromagnetic pinned layer on and exchange coupled to the pinning layer so that  
6     the pinning layer pins a magnetic moment of the pinned layer;  
7           forming a nonmagnetic spacer layer on the pinned layer;  
8           forming a first portion of a free layer on the spacer layer;  
9           forming a nonmagnetic cap layer on the first portion of the free layer;  
10          forming a mask on the cap layer with a width that defines a track width of the read head;  
11          milling away exposed portions of the cap layer, a portion of the free layer, spacer layer and  
12     pinned layer and backfilling with an electrically nonconductive antiferromagnetic material to form  
13     first and second antiferromagnetic (AFM) layers interfacing first and second side surfaces of  
14     remaining portions of the cap layer, a portion of the free layer, spacer layer and pinned layer;  
15          removing the mask;  
16          removing a remaining portion of the cap layer down to a remaining first portion of the free  
17     layer;  
18          forming a second portion of a free layer on the remaining first portion of the free layer and  
19     on each of the first and second AFM layers; and  
20          forming a ferromagnetic second shield layer on the second portion of the free layer.

1           14.     (Original)           A method of making a read head as claimed in claim 13 wherein  
2     the first and second AFM layers are formed of nickel oxide.

15.- 35.   (Canceled)

**Add new claim 36.**

36. (New) A method of making a magnetic head assembly comprising the steps of:  
making a read head including the steps of:

forming a ferromagnetic first shield layer;

forming an antiferromagnetic pinning layer on the first shield layer;

forming a ferromagnetic pinned layer on and exchange coupled to the pinning layer

so that the pinning layer pins a magnetic moment of the pinned layer;

forming a nonmagnetic spacer layer on the pinned layer;

forming a first portion of a free layer on the spacer layer;

forming a nonmagnetic cap layer on the first portion of the free layer;

forming a mask on the cap layer with a width that defines a track width of the read  
head;

milling away exposed portions of the cap layer, a portion of the free layer, spacer  
layer and pinned layer and backfilling with an electrically nonconductive antiferromagnetic  
material to form first and second antiferromagnetic (AFM) layers interfacing first and second  
side surfaces of remaining portions of the cap layer, a portion of the free layer, spacer layer  
and pinned layer;

removing the mask;

removing a remaining portion of the cap layer down to a remaining first portion of  
the free layer;

forming a second portion of a free layer on the remaining first portion of the free layer  
and on each of the first and second AFM layers; and

forming a ferromagnetic second shield layer on the second portion of the free layer;

making a write head including the steps of:

forming ferromagnetic first and second pole piece layers that have a yoke portion  
between a pole tip portion and a back gap portion wherein the second pole piece layer  
comprises said second shield layer;

forming a nonmagnetic write gap layer between the pole tip portions of the first and  
second pole piece layers;

forming an insulation stack with at least one coil layer embedded therein between the  
yoke portions of the first and second pole piece layers; and

connecting the first and second pole piece layers at their back gap portions.